

CLAIMS

What is claimed is:

- 1 Claim 1. - Apparatus [10] to facilitate surface treatment of articles of
2 manufacture [12] of the type having a given handling surface [14], said
3 apparatus comprising:
4
5 a releasable gripping structure [16] for supporting, in a stable position,
6 an article of manufacture [12] of the type having a given handling
7 surface [14];
8
9 a source [18] of elongate stem elements [20], said source being
10 positioned to align a given one of said elongate stem elements [20] with
11 the elongate axis [22] thereof in a predetermined orientation relative to
12 said given handling surface of said plastic article;
13
14 an advancing mechanism [24] for advancing a free end [34] of said
15 given elongate element [20] into contact with said given handling
16 surface [14] of said plastic article [12]; and
17
18 a securing mechanism [26] for fixedly attaching said free end [34] of
19 said given elongate stem element [20] to said given handling surface
20 [14] of said plastic article [12], such that said stem element thereafter

21 fixedly extends from said handling surface to serve as a handle for
22 manipulating and supporting said article.

1 Claim 2. - Apparatus in accordance with Claim 1 wherein:

2 said source of elongate stem elements [18] comprises a reel [36] of
3 coilable plastic rod material [38] defining a substantially continuous
4 supply of elongate stem elements [20], said rod material having a
5 captive end retained in association with said reel and a free end [40]
6 defining said one end [34] of said given one of said stem elements [20].

1 Claim 3. - Apparatus in accordance with Claim 1 wherein:

2 said source of elongate stem elements [18] comprises a plastic extrusion
3 processor for extruding a plastic stem of predetermined dimensions.

1 Claim 4. - Apparatus in accordance with Claim 3 wherein:

2 said advancing mechanism comprises an assembly for axially receiving
3 said extruded stem element from said extrusion processor and axially
4 advancing said stem element into contact with said article of
5 manufacture.

1 Claim 5. - Apparatus in accordance with Claim 1 wherein:

2 said source of elongate stem elements [18] comprises a hopper-feed
3 assembly capable of being loaded with a plurality of said stem elements

4 for axially advancing one such element at a time into a predetermined
5 position.

1 Claim 6. - Apparatus in accordance with Claim 1 wherein:
2 both said article of manufacture and said stem element are formed of
3 plastic, and
4 said securing mechanism comprises an ultrasonic welding assembly.

1 Claim 7. - Apparatus in accordance with Claim 1 wherein:
2 both said article of manufacture and said stem element are formed of
3 plastic, and
4 said securing mechanism comprises a chemical bonding assembly.

1 Claim 8. - Apparatus in accordance with Claim 1 wherein:
2 both said article of manufacture and said stem element are formed of
3 thermoplastic material, and
4 said securing mechanism comprises a heating element to form a
5 thermoplastic bond.

1 Claim 9. - Apparatus in accordance with Claim 1 wherein:
2 said stem element is formed of metal having deformable barbs thereon,
3 and

4 said securing mechanism comprises a force-fitting assembly for
5 deforming said barbs within said article.

1 Claim 10. - A method for facilitating manipulation of articles of
2 manufacture during surface treatment processing, said method
3 comprising the steps of:

4 [100] firmly gripping said article of manufacture in a given position;

5 [200] aligning an elongate processing stem in physical

6 contact with said article of manufacture at a given point of contact; and

7 [300] physically attaching said processing stem to said article of

8 manufacture at said given point of contact, such that said processing

9 stem can be used as a handle for manipulating and supporting said

10 substrate article.

1 Claim 11. - The method of claim 10, wherein:

2 said processing stem is formed of plastic material; and

3 said attaching step comprises thermal bonding of said stem to said

4 article of manufacture at said given point of contact.

1 Claim 12. - The method of claim 11, wherein:

2 both said article of manufacture and said processing stem are formed of

3 plastic material.

1 Claim 13. - The method of claim 10, wherein:
2 one end of said stem is bent at an angle relative to the other end thereof
3 to achieve a desired orientation of said stem relative to said article.

1 Claim 14. - The method of claim 10, wherein:
2 said processing stem is formed of suitably deformable metal; and
3 said attaching step comprises axially pressing a portion of said stem into
4 the body of said substrate article and deforming said stem within said
5 substrate article to form a mechanical bond between said body of said
6 article and said portion of said stem.